ISLAND FOX RECOVERY RECOMMENDATION
FROM THE CHANNEL ISLAND FOX RECOVERY COORDINATION GROUP

TECHNICAL ANALYSIS REQUEST TITLE AND NUMBER IDENTIFICATION

Technical Analysis 3.4: Develop management and husbandry plans for each subspecies, taking into account studbook data, and results from research into best husbandry practices (pen size, social structure, mate choice, etc). The focus for research and management for each captive population will depend on the size and stability of that subspecies' wild and captive populations.

Relates to: Santa Rosa, Santa Cruz, San Miguel
Technical Expertise Group involved: CP

DATE: 12 April 2005

EXECUTIVE SUMMARY:

We thank the Task Force for its thorough analysis of existing knowledge of the captive management and breeding protocols, and its suggested priorities for the research required both to increase productivity and to prepare and monitor captive-bred island foxes before and after release into the wild.

The analysis revealed just how much we know about island fox biology, but also how large are the gaps in our knowledge. Recent data suggest that captive-born island foxes in island breeding facilities are reproducing very poorly, suggesting that production for release will be seriously compromised unless reproductive success improves dramatically. As a result, we recommend that research on the environmental and social correlates of captive breeding success and on the development of mate choice be given the highest priority. Additionally, we recommend several activities to enhance communication among caretakers of island foxes so that new (and existing) information concerning fox biology and management will be disseminated rapidly throughout the island fox community. Finally, we have responded to the suggestion for a research program to provide information for preparing foxes for eventual release by requesting a Task Force (3.5) to develop minimum standardized pre-release and post-release management and monitoring protocols for all listed subspecies of island foxes and to identify priority research that will permit the comparison of methodologies to determine the most successful pre- and post-release management.

BACKGROUND:

Island foxes were brought into captivity in 1998-1999 as a temporary solution to their rapid and dramatic decline, on the northern islands due to golden eagle predation and on the southern island of Santa Catalina due to distemper. The original intent was only to maintain foxes in captivity until the threats to their survival had been eliminated; initial estimates were that it might take 5 years. It has taken longer to rid the islands of these threats than expected and the captive breeding program on the northern islands to produce foxes for release has not been as successful as expected. The breeding success of captive-born island foxes is very low; on the northern islands, captive-born females have produced young successfully less than 8% of the time (compared with wild-born females at 60%) (Coonan, memo 22 Feb 2005).

The poor breeding success of captive-born foxes and the likelihood that island foxes will need to be maintained and bred in captivity longer than originally projected requires a re-thinking of the original assumptions and strategy guiding island fox captive management and breeding.

As the Task Force suggests, the current island facilities appear not to be appropriate for long-term management, breeding and research. Additionally, it is clear from limited success with captive breeding of captive-born animals that there is much we still do not understand about island fox biology and reproduction. The Husbandry Manual coordinated by staff from Santa Barbara Zoo is especially useful as a guideline for current management, having been prepared from the responses to surveys of all existing facilities holding subspecies of Channel Island foxes. The Husbandry Manual, however, is clearly an evolving document and points out the lacunae in our knowledge of island fox husbandry and management. Additionally, we cannot determine from the Husbandry Manual what data exist to demonstrate that one management technique is better than another and results in greater breeding success.

The clear need for improved breeding success and our limited understanding of fox biology suggest that research in fox social and reproductive behavior as well as behavioral development should be a high priority. Most critical, of course, and highest priority, is an analysis of the biologically intrinsic, environmental, husbandry and management correlates of breeding success and the development of management recommendations that are more standardized and have more scientific analyses to back them up. For example, the Husbandry Guidelines mention the use of nearly 10 different types of enrichment items, but with no evaluation of the effects of these different items. Systematic research by fox curators and caretakers on husbandry and environmental variables and their correlation with successful reproduction will provide clearer management guidelines.

Another critical area of research concerns a determination of the best management practices for foxes pre-and post-release. Whilst some practices, e.g. reintroducing foxes in the autumn, appear to be generally accepted as "Best Practices", we have few scientific data demonstrating the best methods for managing foxes prior to release, e.g. how much human contact is acceptable, what is the best feeding regime, what is the best social grouping, etc. Moreover, we do not know if there are individual behavioral characteristics of foxes (e.g. personality characteristics) that result in greater survivorship of certain types of foxes. Thus, there is a great need for a concerted effort to develop research protocols that will result in a set of recommendations for managing the reintroduction program for island foxes.

We have requested a new Task Force (3.5) to develop minimum standardized pre-release and post-release management and monitoring protocols for all listed subspecies of island foxes and to identify priority research that will permit the comparison of methodologies to determine the most successful pre- and post-release management.

RECOMMENDATIONS:

Recommendation 1: We recommend that the Land Managers, with assistance from the Captive Population TEG of the Channel Islands Fox Working Group, standardize record-keeping

protocols to ensure that caretakers collect comparable data in each facility that holds island foxes. Daily records should include, but not be restricted to, diet, feeding schedules and protocols, observed behavior, enrichment items presented, and responses of the foxes.

We will copy and distribute the Husbandry Manual and the results of the husbandry workshop held in 2003 at Santa Barbara Zoo to all managers and caretakers of island foxes. Additionally, it is important that the Captive Population TEG continue to review and update the Husbandry Manual each year to reflect new knowledge. We suggest that a captive breeding and management email group be formed to facilitate the sharing and exchange of new and existing information about the husbandry, biology, and captive management of island foxes. This forum should assemble references to all published papers on island fox biology and husbandry so that new curators and caretakers can rapidly find all existing information important for managing foxes.

Recommendation 2: As indicated by the Task Force (3.4), the Channel Islands captive breeding facilities are not ideal either for a long-term genetic reservoir of captive island foxes or for conducting the type of research required to determine "Best Practices" for management, husbandry and reproduction of island foxes. The RCG is developing a Technical Analysis Request to evaluate the costs and benefits of moving foxes to mainland facilities and the criteria for choosing which subspecies might benefit from a long-term mainland captive population. In the interim, we strongly recommend that three research projects be initiated immediately: 1) an evaluation of the environmental correlates of reproductive success, 2) a comparison of the social and reproductive behavior of currently successful vs. unsuccessful breeding pairs, and 3) a study of the development of mate choice in non-breeding pairs and yearlings. We will request that a Task Force immediately be charged with developing the study design for Projects 2 and 3, including doing a cost-benefit analysis of the best methods for recording data in the current island facilities and what facilities would be needed for assessing mate choice.